Notes
on
Climate
and
Some Diseases affecting Europeans
in
West Africa

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In dealing with the subject of this thesis I propose to take up the points in the following order: first, the nature of the climate as regards season, temperature etc, then the kind of constitution most likely to resist the unfavourable conditions prevalent here, and the conditions produced by climatic influences with some of the chief methods of maintaining health, will be considered.
In the second half of the thesis I propose to note briefly some of my experiences of the most prevalent types of disease affecting Europeans, met with on this Coast.

Two years continuous residence in Old Calabar, Niger Coast Protectorate West Africa, has presented me with opportunities of observations on the points indicated above."

The Nature of the Climate.

For the purposes of this thesis the West Coast of Africa may be defined as extending from Senegambia in the West to the German colony of Cameroon

in the East

Although there are local variations as to the changes of seasons and their length, yet these are so unimportant as to justify one in saying that the climate of the West Coast is nearly uniform all over the part referred to. This is the portion of the Coast which has received the dread-inspiring name of the "White man's grave", but however much that term may have been deserved in the past, there is no doubt that at the present day the conditions of living in this part are much improved, and by the closer acquaintance with the causes of diseases peculiar to the tropics, and the improved sanitary conditions which are becoming more prevalent every year, much of the sickness and death so common in the past will be more easily and surely combated in the future.

The two outstanding features of the West African climate are extreme heat and moisture. There are two principal seasons

the dry and the rainy, but these gradually pass into one another by means of the intervening tornado seasons.

The Dry Season in the Niger Coast Protectorate generally begins about the second or third week in December and continues till the beginning of April.

During this season there are long periods of absolute drought; in my own experience I have known ten weeks to pass with a single drop of rain. The little rain that does occasionally fall is very quickly absorbed into the ground which is hot and parched from the intense solar heat.

From the beginning of the year till the end of march 1897 there was only 1 inch of rainfall

The maximum temperature during the season varies from 95° F. to 105° F. There are however very sudden falls of temperature during this season. Soon after sunset the temperature falls very rapidly and sometimes the nights are quite chilly.

I have noted sometimes a difference

between the maximum diurnal temperature and the minimum nocturnal temperature of 20°F. but the average variation is from 10°F to 15°F.

The extreme heat however is often subdued to a slight extent by the presence in the atmosphere of the "Harmattan" or "Smoke" which hang as a heavy white mist in the air. The Harmattan is not continuously present during the hot season but is more prevalent during the months of January and February than any other part of the dry season, and the great variations of the temperature are chiefly associated with the presence of the "Harmattan"

The great danger to health during the dry season is from the sudden changes in the temperature, which, if not guarded against, cause a chill and thus, by weakening the vis medicatrix naturae leads on frequently to disease.

Between the dry and wet seasons there is a short intermediate season in which tornadoes are prevalent. These occur during the months of April and part of May; and again

during the month of November and part of December.

The temperature in these seasons is generally the same as in the dry season, but there are storms of wind, rain thunder and lightning and during these storms the variation of temperature is often as much as 7°F or 8°F in half an hour.

The Rainy Season begins about the middle or end of May and continues till the middle or end of October.

The average temperature is from 80°F to 90°F. and there are not so many sudden changes in the temperature as during the dry season, while the difference in the diurnal and nocturnal temperatures averages about 5°F.

During this season the rainfall is constant and very heavy, the whole averaging from 55 to 58 inches.

Closely connected with the seasons are the various types of disease, there being a marked relationship between the degree of heat and moisture on the one hand and the prevalence of disease

on the other
Malaria is more prevalent and often of a severer type during what is called the 'change of seasons' and at the early part of the rains, as at these times the conditions most favourable to the development of the disease are abundantly present.
Malarial fever may occur and does occur at all periods of the year, yet during the times referred to, the death rate among the Europeans is undoubtedly higher than at other times.
Immediately after my own arrival in the Protectorate (which was in March 1895), during two months there were five deaths from a severe form of fever while for at least the three immediately preceding months there were no deaths at all.
Then again in the last change of season, from the middle of February to the middle of April 1897 there were four deaths from fever.
When it is taken into account that in this part of the Protectorate the European population rarely exceeds a total of 80 of all classes it will be seen that the death rate at these

times is extremely heavy
During these months the temperature is still high and almost equal to that of the dry season, while rain is beginning to fall heavily but not continuously, so that one day the soil is saturated with water, while the next there may be no rain and the temperature very high. In this way we have the two chief factors in the production of malaria acting together, moisture evaporating rapidly from the earths surface under the influence of the extreme heat.
Felkin in "Geographical Distribution of Tropical Diseases in Africa" p. 33 says 'The rainy season is far more unhealthy than the hot months, especially at its commencement and to a less extent at its close. The temperature of the air falls at the beginning of the rains, producing a feeling of vigour after the intense heat, but the moist atmosphere, combined with the sun's rays, greatly increases the perspiration and along with this there is a relaxation of the muscular system, with cardiac debility and congestion of the internal organs. Should the rainfall

be scanty, irregular and alternating with hot weather, severe outbreaks of fever are to be expected from the formation of pools of stagnant water rich in organic matter"

At the beginning of the rainy season the level of the subsoil water is very variable, and the result of this being that air is constantly being sucked in or driven out the danger of Malaria is increased. It is at these times, the change of seasons at the beginning of the rainy season most, that we look for epidemics of grave forms of malaria.

Other diseases also present a distinct connection with the nature of the seasons Respiratory troubles and Rheumatism are very much more in evidence during the rains

During the dry season affections of the skin are aggravated and often induced by the sodden condition of the skin through the excessive prespiration. It is at this season also that residents on the West Coast run most risk from heat apoplexy; and boils are also a source of trouble in the dry season

Having thus briefly noted the nature of the climate and its influence in the causation of disease, I propose now to make a few notes on the nature of the constitution most suited to the peculiarities of this climate.

In connection with this there is one statement which I heard Dr. Laws of Livingstonia E. Central Africa, make while I was a student and this has always stuck to me, latterly with increased force due to my own experience. He said "If I had two individuals placed before me for selection for a tropical climate, one of whom was a tall, powerful, muscular person, in all senses an athlete, and the other was a medium built thin wiry person, with no great store of muscular power, I would undoubtedly choose the latter for tropical residence."

My own experience all tends to confirm this opinion.

The individual with well developed body and sanguine temperament has a tendency to congestive affections and thereby in a tropical climate is more likely to be a victim to the grave types of disease, especially those forms of

malaria associated with hyperpyrexia.
The individual in whom there is a blending of the nervous and bilious temperaments is the one more likely to withstand the advance of disease in the tropics.
The nervous, wiry individual has great power for enduring fatigue and go through a good deal of work; while if he has a touch of the bilious temperament in him he can combine with the above qualities the power of resisting external impressions. While it is of considerable value of have the bilious temperament, yet any tendency of a marked nature towards biliousness ought to be counted an unfavourable indication. This cannot be too strongly insisted on, for anyone possessing such a tendency will be very likely to become a subject to the hepatic troubles so common in the tropics. In such a person, what would be an ordinary fever in another type of individual, becomes a grave type. I can never forget a very remarkable example of this in the case of a young man, assistant in one of the trading establishments here. While at home he suffered from

what he described as attacks of 'biliousness' often lasting for a week. During his first term of service here, which did not quite reach to two years, he suffered frequently from bilious-remittent fever. Owing to this he went home sooner than he otherwise would have done, but against the medical opinion expressed here, he returned. A very few months after his return, his first fever attacked him, and with the old bilious ~~attack~~ symptoms. Jaundice became marked and bilious vomiting occasioned him great distress. He was at once removed to the European Hospital where with stringent attention and careful nursing the symptoms subsided somewhat, but in a day or two a rapid relapse took place and he died.

In physical appearance he was just such a person as one judging from the appearance would say was suited for the tropics, but that tendency to biliousness ought to have marked him as unsuitable. However much one may be suitable in other points, the tendency to

biliousness ought to raise an insuperable barrier to such an one being sent to the tropics.

Other tendencies must also be taken into account in ~~the~~ selecting men or women for residence in the tropics.

Any one with a family history of nervous disease ought to be put aside. This is especially important in females.

The well known connection between nervous diseases and diseases of the female generative organs must always be borne in mind. In the tropics functional diseases of these organs are among the common diseases that we have to deal with; and any one originally possessing a predisposition to disease of the nervous system is too likely to have such a latent predisposition roused into active disease by the existence of disorders in the generative organs.

In my own experience as medical missionary I have seen frequent examples of the above, and in these cases invariably removal to a temperate climate has restored the natural functions of the organs in question, and following on this there

has been a cessation of the nervous symptoms.
A point of great interest though perhaps
not of much practical value, is whether
anyone with a family history of the phthisical
taint, but otherwise entirely healthy, ought
to be permitted to go to the tropics.
Undoubtedly anyone with the slightest signs
of active phthisis ought to be prohibited,
but occasionally one meets with cases
where there are no symptoms and never
have been in the individual himself,
though there is a history of its presence
in one or more of his relations.
In such a case is it right to send
the individual to a tropical climate?
I can only attempt to deal with this
point in a general way, and from
experience of cases in this part of the
tropics. My own opinion is that all
other things suitable, I would not
raise this as a barrier to such
an individual coming to the tropics.
My experience of some very marked
cases of phthisical family history is that
the individuals in question are
undoubtedly better off here than at
home. I think I may safely say

that with care such an individual has even a more favourable chance of overcoming his family tendency here than at home.

Effect of the Climate on the Constitution

This in some new arrivals is very marked, while in others there is little or apparently no change whatever. At first the new arrival feels a sense of exhiliaration, provided he has arrived in the cool season. He seems to be able to go through a great deal of work, and is rather inclined to make light of the dangers of the climate. He feels so well that he rather scorns the slower pace of the 'old-coasters' who know only too well the deceptive nature of the climate under which they are existing. In a month however, or a little more, the new comer begins to modify his tone a bit, and is not quite so eager for sustained labours and by the time he has been three months in the country he is beginning to be rather doubtful about the climate and to believe that the ways of the 'old coasters' in regard to work etc are after all fairly correct. The pyschological states of the

new comer are well marked and distinct. Beginning with a roseate optimism which dispels all doubts and dangers as soon as they are thought upon, this state of mind quickly gives place to a dismal pessimism in which all sorts of fears are dwelt upon and should an attack of fever make its presence known the patient has rather a trying time. When however both these extremes have passed away, a more reliable and better balanced mental condition becomes established, and with the experience acquired the new comer is able to look at things in a common-sense way, so that while believing that the bad reports of the climate have been exaggerated to some extent yet he knows enough of the real dangers to cause him to be ever watchful lest by any indiscretion or fault of his own, he may lessen the power of the natural forces at work within him to resist disease.
These states of mental variation are the outcome to a large extent of the bodily conditions prevalent for the time being.

At first, and coincident with the stage of exhiliaration already spoken of, the respiration and circulation are increased. This however soon gives place to the reverse conditions when the respiratory movements are fewer and the pulse rate less.
Along with these reversed conditions there is a far greater activity of the skin than formerly and this is balanced by a lessened secretion of urine.
At this time also there is a possibility of anaemia setting in. This however in those of a robust type is rather a favourable indication than otherwise as fewer red corpuscles are required consequent upon the diminished inhalation of oxygen by the slowing of the respiratory movements.
At this stage also there may be a slight indication of liver disturbance occasionally going so far as to develop into a slight attack of Bilious Remittent Fever, which is looked upon by many as being of the nature of an acclimatisation fever.
Having successfully got over these stages it may reasonably be expected that with

case the individual is now able to resist the influences of the climate as far as a European possibly can.

Before going away altogether from the question of climatic reaction I would like to make a few notes on the special influences of the climate on the European female constitution: The effect of the West Coast climate on the menstrual processes is very varied while the influence of the climate is to a great extent towards producing sterility in females who would as a rule be productive at home (i.e in a temperate climate) Arthur J. Weatherly in the "Lancet" for Feb. 2nd 1895 states that "a larger proportion of women are sterile in malarial districts and that the sterility becomes permanent after long residence; whereas after a short residence they bear children on going to a healthy climate."

These facts are very aptly illustrated by the following figures:-

During the last 10 years there have been at various times twelve

married ladies attached to the mission in Old Calabar.

Out of these 12 only 2 have conceived and borne children while here, that is a little over 16% of the whole have been productive. Of the remainder, that is a little over 83% none conceived while under the influences of this climate. Of this number 4 or 40% of those sterile while on the Coast (i.e. over 33% of the whole) conceived when under healthier conditions.

The rest 50% of the whole did not conceive at all owing to the fact that they have been and are still under the climatic influences.

These figures show very clearly the tendency of a malarial climate to produce sterility, and also that such sterility is possible to be overcome provided the individual is removed to a temperate climate within a reasonable time. The longer the period of residence the less chance there is of being able to overcome this condition.

The effects of the climate on unmarried ladies in regard to menstruation are

varied. A good many become subject to amenorrhoea and in one case the person suffered from metrorrhagia. Of these I will make a few notes under the diseases.

The last point I wish to note under the heading of Climate is that of <u>Methods of resisting Climatic Influence</u>
These are many and might include the whole question of hygiene as regards houses, sanitation and protection of the individual, but in a thesis of this kind such a subject would be too large to be dealt with. I propose however to state some of the general points of much importance which when attended to will do much to help the individual ~~to ward~~ to ward off disease.
One of the first points of importance is clothing. The great thing to be dreaded in a tropical country is the risk of Chill, and to prevent this, while at the same time avoiding undue weight in the way of clothing is the end to be sought for.
All underclothing should be of thin

flannel, while all top clothing should be woolen or flannel also.
When clothes get wet from perspiration or any other cause, a probable attack of fever will be warded off by putting on dry clothing after a vigorous rub down with a good rough towel.
Food is best taken in the cool of the day, as digestion is more vigorous then so that the heaviest meal ought to be taken between 6 and 7 pm
Alcohol ought to be taken as little as possible, and then only after the day's work is over. We have to resort to it in sickness; if it has been used sparingly in health its effects are easier obtained when required in sickness.
Water, so frequent a source of disease, ought always if possible to be collected off iron roofs into lock-fast tanks. No native can then contaminate the source of supply, and it does not become impregnated with germs from the soil. In all the European houses here, this is the method adopted for the water supply for cooking and drinking purposes and the result is that dysentery is almost unknown

Besides having a safe supply it is well always to still further diminish the risk of disease by only using water for drinking purposes which has been boiled and filtered.
House situation is a very important point. The ideal is a house built on a site slightly higher than the surrounding land, with all trees and bush close up to the house cut away so as to admit of a free circulation of air round the house, but with a belt of trees at a short distance in order that the winds may be partially filtered by the foliage.
The advantage of a natural drainage away from the house on all sides is very great, as without this water is apt to gather round the site and thus prove a location for the development of mosquitoes, a factor to be attended to in view of the theory that mosquitoes are agents in the malarial infection.

Attention to these points is extremely important for after my experience here I confidently assert that malaria, the chief among tropical diseases, can be reduced as regards its dangerous

manifestations to a minimum by a careful attention to the mode of life and ensuring hygienic surroundings as far as possible.

Part II Notes on some Diseases affecting Europeans in West Africa

Skin Affections:

Prickly heat is one of the first ~~affections~~ diseases to attack Europeans in West Africa. Not of itself a dangerous disease, it is nevertheless a source of annoyance and discomfort. It affects Europeans chiefly at the outset of their residence, and as the skin gets accustomed to the extra physiological strain upon it, prickly heat disappears almost altogether, except when the skin has had an extra amount of work thrown upon it by excessive perspiration in an attack of fever.

Some people are more liable to it than others, and in these the advent of the hot season is accompanied by the characteristic eruption.

The presence of the disease is ~~shown~~ demonstrated by the back, chest, abdomen, arms and backs of the hands being covered

by a distinct papular eruption of a red colour. The papules are separate, and at first hard, but soon each papule is pointed by a small white vesicle from which on pressure a small drop of serous exudation may be obtained. Intense itchiness accompanies the eruption and at first the sufferer finds it a difficult matter to restrain his desire to scratch the affected parts. This stinging itchiness is very much increased by any violent exercise, or by excessive consumption of fluids. As the attack begins to subside the papules become of a brawny tint until they fade away into a yellowish tinge of the skin. This change of colour is accompanied as a rule by a fine desquamation.

The length of the attack varies from a few days to weeks and the disappearance is accelerated by any fall in the atmospheric temperature or by lessened secretion of the skin.

The disease is due to a congestion of the sweat glands from over activity of the skin

Erythema, in many cases is just an exaggerated form of prickly heat. It is however apt to develop to such a degree as to deserve separate description.

Like Prickly heat it is chiefly confined to new comers to the tropics.

Its Aetiology, like that of Prickly Heat is based on the excessive action of the skin in sweating, but unlike Prickly heat it shows a predilection for certain situations, namely the folds of the axilla and the scrotum and adjacent parts, so much as as to entirely deserve the name of Erythema Intertrigo.

It consists of an inflammation of the corium with consequent swelling of the parts affected and a sticky serous exudation which gives to the skin a 'weeping' appearance

The inflammation manifests itself in the form of slightly raised red patches with very slight vesiculation

In a great many cases the patches show a tendency to the circular form, and having the size of a threepenny piece to that of a sixpence. Each little patch consists of a

number of red ~~confluent~~ points all gathered together into one mass.
From these patches there comes a serous exudation. While not causing actual pain the eruption, with the exudation, gives rise to much discomfort if it is in the situation of the scrotal fold.

Treatment of Prickly Heat and Erythema both run on the same lines

Attention must be paid to avoiding any cause of increased action of the skin such as violent exertion of any kind and the use of heavy clothing.
The application of astringent and soothing lotions is useful.
For the severer forms of Erythema, the parts must be kept well separated and as much rest given to them as possible.
Some believe in the use of Chrysophanic acid in the form of an ointment, but in cases where I have seen this used, the cure has been worse than the disease.
The most rational line of treatment, after having separated the parts, is to pack the spaces well with dry

but dredged with an astringent dusting powder such as Boracic Acid and Starch, or as was useful in my own case, 1 part of Salol to 4 parts Boracic acid.
Beyond this nothing more is required except to keep the bowels acting.

Filaria Loa

The affection resulting from the presence of this worm in the body may be set down under the skin diseases as the worm has its habitat in the subcutaneous tissue.
This small worm has a pretty general distribution all over the West Coast. Here in Calabar it is very common among the natives, and is also frequently met with among the European residents.
It varies in length from about 1/8th of an inch to sometimes over 1/4th of an inch, and its thickness is generally about that of a fiddle-string. I have seen one almost twice that thickness but that was beyond the general average.
Its location is in the subcutaneous

tissue, within which it seems to have the power of wandering all over the body. The situation in which it is most easily seen and where it gives rise to the most prominent symptoms is in the subcutaneous tissue of the eye. At one time it is seen below the conjunctiva of the eyelids; at another time it is in the subcutaneous tissue of the eye itself. Its movements are of a wriggling nature and it seems to be able to transport itself very rapidly.

When found in the eye, it gives rise, by its presence as an irritant, to hyperaemia, swelling and heat in the parts. There is no actual inflammation. Pain may be either of a pricking nature, or it may come in sudden sharp darts, and is accompanied by a flow of tears.

I have seen the eyelids swell up so much, when affected by this filaria as to entirely close the eye. Yet with the retreat of the worm to other parts, the pain and swelling rapidly subside, without leaving any evil

effects. When the worm appears in other parts of the body, it rarely gives rise to any symptoms of a pressing nature, except the temporary annoyance of feeling a worm under the skin. I have known it to be found in the subcutaneous tissue of the hand, of the thoracic wall, and of the forearm.

Manson has suggested a relation between this worm and Filaria Diurna, that the Filaria Loa may turn out to be the female parental form of F. diurna.

In one case, where two specimens of Filaria Loa were removed in this country, I have had the opportunity of examining blood of the patient drawn at different intervals and these specimens certainly show Filaria embryoes present, but only in the slides of blood drawn between 10 pm and 6 am, suggesting rather Filaria Nocturna.

The Treatment is to fix the worm with a hook and cut down on it, when it can be extracted.

Nervous System

Heat Apoplexy: Sunstroke in its intenser forms is in my experience, an extremely rare thing on the West Coast. Every one is so fore warned about it that he is more or less protected against it, by the ordinary precautions in daily use, but in a great many cases there are milder forms which assert themselves whenever one is off guard and not expecting any evil results.

Very few run the risk of going out in the heat of the day, unless well protected; but many run great risk by going out in the afternoon, when the sun's rays are on the decline, but yet powerful, without having the neck in any way specially protected.

These suffer from a mild form of heat stroke of a syncopal or cardiac form.

The patient has a sense of weakness and faintness coming over him. The surface of the body may be cool but the temperature is high, and the pulse feeble and rapid.

There is often a sense of weight at the back of the head in the occipital region and this is greatly relieved by the application of cold cloths to the part.

The treatment consists in reducing the temperature by cold douches or packs, at the same time watching the pulse in order that the action of the heart may be sustained.

In extremely severe cases death may result from coma, preceded in a few cases by delirium or convulsions.

Hysteria: This disease may affect females in the tropics in varying degrees. I have seen it in very slight forms while in other cases it has been so severe as to approach the disease described in text books as "hystero-epilepsy".

It affects females at all stages of their residence on the coast; the length of residence seeming to be of little or no avail in diminishing the risk of its appearance. Its appearance may be associated with other functional or organic disease, such as menstrual

irregularities, or there may be nothing more than simply a 'run-down' state of health.
Whatever the other conditions associated with it, it is undoubtedly a disease in which deficient will power is the pre-eminent factor.
The symptoms vary greatly in each case, but in all there is the one point of importance viz that these symptoms can to a great extent be overcome by the patient herself resolving firmly that she will not give way to them.
To enable her to do this however, in the great majority of cases, her will power has to be strengthened by the removal of such physical causes as may exist, and unquestionably in the tropics, one of the first steps toward this is complete change of the surroundings in the form of a sea trip.
Thus, coupled with the deficient will power (or perhaps to a certain extent causing it) There is the debilitating nature of the climate and when one considers how much this can do

in the case of a strong healthy male, one cannot wonder at the nervous disturbances it may give rise to in the delicately balanced nervous system of a female.

Symptoms In a slight case there may be chiefly mental, as sudden and uncalled for exhibitions of joy or sorrow. The patient may weep in an apparently sincere way for a time, and when asked for a reason can give none or one in no way proportionate to the grief shown. The slightest excitement or overwork may be the occasion for calling forth this display, but it does not last long.

In the majority of cases other symptoms are associated with the above, and these are of both a sensory and a motor type.

I have seen a patient otherwise bright and cheery suddenly become quiet, and when spoken to become apparently unconscious. Breathing is very rapid and irregular, consisting of a series of gasps each one longer than its predecessor, until with a

long drawn sigh the act of respiration seemed to be suspended for the time being. In a very short time there comes another short gasp and the whole process is repeated again. During all this time the patients countenance is as a rule pale, but there is no foaming at the mouth, nor yet any biting of the tongue. The pulse is strong although slightly accelerated.

While in this condition, if spoken to the patient does not answer and takes no apparent notice of all that is going on around her. There is however in most cases during this stage a low muttering delirium.

There are contractions of the muscles sometimes of a tonic nature, at other times of a clonic nature. I have seen a patient lie perfectly rigid in bed the one moment and the next she would be attempting to sit up and clutching at ~~unreal~~ imaginary objects in front of her.

This fit may last for a minute or it may go on to three or four minutes duration. When it comes to a close the patient slowly recovers consciousness

and wakens up with a dazed expression on her face. There may be only one fit or there may be as many as four or five with a short interval between each. In the interval, the patient complains of all sorts of pains and disorders. A very common complaint is that of the 'globus hystericus'. The patient says there is a ball of air or some such substance generated in the stomach, which travelling up the oesophagus gives rise to a choking sensation, and do all she can in the way of retching and attempted vomiting she cannot get rid of this.

My patients have always complained of a sharp, stiping pain in the left hypochondrium associated in the patients' mind with heart disease. One patient was so positive about this that she always talked about it and only got the idea dispelled after an examination by the stethoscope Along with these sensory impressions there are others of a similar nature such as dyspepsia associated with flatulent distension of the abdomen

In many cases this flatulent distension has been caused by the patient swallowing mouthfuls of air in her vain endeavours to get rid of the Globus Hystericus.

There is generally some perverted state of sensation in the skin. Very often this takes the form of hyperaesthesia, while in others it may be in the form of analgesia or anaesthesia.

The fits come on as a rule at irregular intervals, but they may assume quite a regularity so that they may be almost looked for. I have known them come on regularly at bedtime for several nights in succession, and they interfered with sleep to such an extent that until a hypnotic had been administered there was no hope of sleep.

Along with these sensory and motor symptoms there may be actual disease in existence and especially functional diseases of the generative organs; these have to be noted and taken into account.

Whatever may be the Pathology of this disease in temperate climates, my

experience here leads me to believe that in the tropics it is undoubtedly an expression of Malarial poisoning. In all the cases I have seen or investigated I have noted the fact that the patients affected by Hysteria have not recently had an attack of Malarial fever either in the Remittent or Intermittent forms. Rather in many of these cases it has been their boast that for so many months they have not had fever while at very time they are suffering from this other disease which in my opinion was just the malaria in the system expressing itself in another way. In most of the cases a respite was gained from the hysterical symptoms by the onset of remittent fever. As soon as ever the fever set in the hysterical symptoms began to abate in a marked manner, and died not recur for a long time afterwards. These observations spread over a number of cases lead me to believe that the hysterical symptoms in the tropics are in many cases an expression of the malarial poison in the System

which for some reason or other does not for a time cause fever; but when fever does supervene it has a beneficial effect in clearing the patient's system from the poison and causing a total disappearance of the hysterical symptoms.

Treatment- This consists in the great majority of cases in seeking to brace up the patients will power and at the same time removing all causes of mental depression & bodily weakness. The disease may be cured by nature herself in the way of an outburst of fever, but short of this it is the physician's duty to seek by all means in his power to remove all causes, either physical or mental, that may exist while at the same time by careful exhibition of drugs he may do much good in overcoming distressing conditions.

Where there is irregularity of menstruation this must be removed, as females by dwelling on such troubles are apt to magnify them and so confirm the morbid state that they are in. For the general state of health I have found

that the administration of Quinine, Iron and Arsenic does good. It acts as a nerve tonic while at the same time its action is anti-malarial and so we are able to strike at what I believe to be an important factor in the causation of the disease. Where one symptom presents itself prominent to the mind of the patient it is well to do something to overcome this; as, in the case of patients complaining of dyspepsia with flatulent distension I have found a mixture of Creasote and Spt: Ammon. Aromat: of much use.

For the generally excited condition associated with sleeplessness I have found that a combination of Pot. Brom. with Chloral has given the best results. I have tried Sulphonal and other hypnotics but none have given so much satisfaction as the Bromide and Chloral in gr x doses of each. Never have I had occasion to give more than two doses in one attack. But the best treatment of all and the one that must ever be sought where at all possible is a complete change

of surroundings and removal from malarial infection in the form of a sea trip. The worst cases I have ever seen have always responded after a time to this.
A new vitality seems to enter into the patient as she breathes the fresh sea air, and although it is with a struggle often severe, yet ultimately she is able to assert her will power till soon all trace of the disease has disappeared.
Cases that have been simply desperate with as many as half a dozen bad fits each day for many days in succession, have after a voyage of three or four weeks been entirely cured.

Menstrual Irregularities

In some form or other, nearly every European female resident in the tropics suffers from functional disease of the female organs. The general debilitating effects of the climate, associated with a more or less constant quantity of malarial poison in the system, conduce to these disorders.
Dysmenorrhoea is a form that occasionally presents itself but by no

means frequently; the more constant forms being either Amenorrhoea, or Metrorrhagia and Menorrhagia.

Amenorrhoea This form of functional disease of the female organs is the chief form presenting in the Tropics.
Soon after settling in a tropical climate, the constitution passes through a climatic reaction and one of the most frequent symptoms of this in the female is Amenorrhoea. This is the result of the Anaemia already mentioned as part of the general constitutional change. Where the anaemia is comparatively slight it is by no means dangerous and the resulting amenorrhoea is not to be viewed as a grave symptom. There is no inconvenience as a rule resulting from the Amenorrhoea and many European ladies live in the tropics, without any impairment to their general health while they are, at the same time, the subjects of Amenorrhoea.
In some however it is otherwise. With them, amenorrhoea is present as a

disease per se, sometimes with and sometimes without anaemia. In such cases, the cause of the Amenorrhoea is in all probability Ovarian torpidity. Where amenorrhoea arises from this cause, there are other symptoms of a general want of tone of the whole system. Along with the amenorrhoea there is as a rule constipation and general muscular debility so that the patient is not fit for much physical exertion. At the period when in the ordinary condition the menses are expected, there is a sense of fulness in the pelvis, even at times amounting to actual pain.

In one case of this kind, there was associated with these symptoms an abnormal increase in the adipose tissue all over the body, and an entire absence of Anaemia.

Treatment: In the cases where it is due to the climatic reaction, treatment of the ordinary nature may be adopted, that is in the way of improving the general health, but in the event of failure to overcome the Amenorrhoea it is well not to push the treatment

as the Amenorrhoea will not give rise to any inconvenience.

Where however the disease is due to Ovarian torpidity, and is accompanied by other conditions denoting a general atone of the system, treatment must be pushed until an effect is produced.

Between the menstrual periods a general tonic containing nux vomica and iron may be given; attention at the same time being directed to keeping up a free action of the bowels.

About a week before the menstrual period, a course of treatment by means of Pil. aloes et Ferri (B.P.) may be begun by one pill each night for three nights and then increasing to one pill night and morning immediately before the period. If this does not have an immediate effect, then the dose may be increased to two pills night and morning during the period. To assist the natural functions during the period hot sitz baths should be used at

least twice a day until the natural functions are restored.

Menorrhoegia and Metrorrhoegia

These two forms of disease are less common than the previous, but one or other is often to be found in plethoric females resident in tropical countries. In some cases these diseases may be looked upon as a physiological attempt on the part of nature to rid herself of the excess of blood in these plethoric cases.

In the majority, however, these diseases are due to a relaxation of the walls of the blood vessels, induced by the extreme heat.

In mild cases there may simply be an excess of the normal flow at the menstrual periods (menorrhoegia), or in the more severe cases, there is great irregularity in the periods frequently only a fortnight intervening between them.

There is usually a certain amount of pain accompanying the excessive flow, and a great deal of bodily weakness owing to the drain upon

the system. If this is long continued symptoms of anaemia begin to manifest themselves, such as giddiness and ringing in the ears, pallor, shortness of breath, palpitation and in many cases, dyspepsia.

Treatment: The first indication is to stop the excessive flow and this is best accomplished in most cases by a combination of Iron and Ergot. This gives tone to the walls of the blood vessels and to the muscular fibres of the uterus and so puts a check on the excessive depletion of the system.

After this has been effected, it is well to combat the anaemia by a mild form of iron (such as the Syrup Ferri Protochlor.) and this in combination with Liq. Arsenicalis overcomes the anaemia while at the same time the Arsenic by its alterative and anti-malarial properties combats the great cause of most tropical debilities, the presence of malaria in the blood.

Rheumatism: This disease in the tropics generally manifests itself in the chronic and sub-acute forms, rather than in the acute. Among the Europeans, with whom I have had to do here, I have never seen acute rheumatism; but there have been many cases of chronic articular rheumatism, combined in many instances with a form of muscular rheumatism, called "Calabar Swelling".

Among the natives of the country many cases of acute rheumatism present themselves; and of the deaths from cardiac disease, it is safe to say that over 75% of them have had a rheumatic endocarditis as the starting point.

Here, in the rainy season, we have all the elements present which are commonly supposed to be elements in the causation of this disease viz excessive moisture and cold. The cold of course is not severe when compared with the cold in a temperate zone; but on the other hand a constitution which has passed through the extreme heat of

one or two tropical dry seasons is very susceptible to a sudden drop of five or six degrees of the thermometer when that is accompanied by heavy rain. Thus these two elements combined tend to induce this disease. It is generally those who ~~o~~ have been longest in the country who are most affected by it. One individual who had been over forty years resident here suffered very much from chronic rheumatism during the last five or six years of her stay. Another who had been over twenty years connected with the country suffered likewise in a very marked degree during the latter years of his residence. Such individuals are very sensitive to changes in the weather, which as a rule are manifested by an outburst of the rheumatic symptoms. The disease is rarely seen in new residents

Symptoms: These are the usual arthritic symptoms of chronic rheumatism; swelling of joints with pain, tenderness and stiffness. The parts that in my experience are more

affected than others are the ankles and the joints in the feet, with the wrists and the joints in the hands.
Any attempt at movement is accompanied by pain; and the onset is generally sudden.
The patients are generally anaemic This is a pretty well marked feature in all the cases I have seen. The appearance of the face is almost pathognomonic, there being a peculiar anaemic, pasty appearance during the attack. This passes away with the subsidence of the disease.
There is little or no desire for food
Fever is generally absent.
The heart is frequently affected; and one feature of this I have seen now and again is the missing of a beat.
Accompanying the above symptoms there is very frequently what I have already called "Calabar Swelling" This is of the nature of muscular rheumatism. The most frequent site for it to appear is in the forearm. Then the whole fore-arm is swollen up from the elbow to the wrist, and sometimes also

the dorsum of the hand. The affected part is hard and tense; but there is a complete absence of heat or redness. At first there is no pain, but in a little while the part gets very tender and the slightest movement or touching causes pain.

There is little or no effusion into the joints, the disease there being of the chronic type. Other parts may be affected but not so frequently as the forearm. The dorsum of the foot comes next to the forearm for frequency, and less generally than either of these the thigh may be the spot affected.

The affection is a rheumatic condition of the muscles and fasciae.

Treatment: In the ordinary chronic forms without the "Calabar Swelling" counter-irritation externally by means of stimulating liniments combined with the administration of Pot. Iod. and Arsenic internally, or some tonic, gives the best results. Where however there is the muscular affection as well, I have found that a good saline purge and an

application of equal parts of Tinct. and Liq. Iodin. to the swelling form a good beginning for the general treatment. This consists in the administration of Salicin or Sodium Salicylate 10 grs thrice daily until the swelling has gone down and then for four or five days after.
Salol has been tried, and also quinine with the idea of a malarial origin to the swelling, but I have found the above to be the most reliable form of treatment.

Malaria:

On the West Coast of Africa, malarial fever and diseases having a malarial element complicating them, form by far the largest proportion of a medical man's cases. All the conditions required for the constant reproduction of the malarial parasites are present, in the great heat of the atmosphere combined with the excessive moisture so prevalent all over the coast. The disease in its varied forms is both endemic and epidemic

Its endemic forms are milder generally than the epidemic; they are chiefly of the nature of remittent fevers, the intermittent being comparatively rare on the coast. In my own experience the number of cases of Intermittent fever among Europeans would not form more than 5% the remaining 95% being remittent.

The epidemic forms are chiefly of the remittent type with the presence of some very prominent symptoms, ~~who~~ from which the form takes its name, such as the Haemoglobinuric, in which along with the continued fever there is present to a marked degree, Haemoglobin in the patient's urine.

These epidemic forms are associated I believe with some special change in the atmospheric and soil conditions which cause the disease to take on the dangerous type.

In a recent epidemic of Haemoglobinuric fever every case came from among the commercial community residing on the beaches along the river. Their houses are in all cases either directly over or alongside of the

mud which at low tide is left free of the river current and consequently open to the action of the sun's rays. One could not imagine more likely conditions than this swamp, with its natural dangers augmented by the presence of all the decaying vegetable and animal matter so constantly deposited there, for the production of dangerous types of a disease which even in its milder forms is germinated in soil saturated more or less with moisture. That these unhealthy conditions of residence were important factors in the production of the dangerous types was proved by the fact that none of the other Europeans, that is, those living on the hill away from the river, were at all affected by the prevailing type.

Malaria is pre-eminently a disease germinated in certain conditions of the soil and atmosphere and the chief of these conditions are

I A soil in which moisture is easily retained; this is best

obtained where the subsoil is clay.
and 7 Increase of Temperature
associated with a moist atmosphere
thus causing an irregularity in
the level of the subsoil water.
These conditions are to be found ~~in~~ a
great degree at the end of the dry
season and the beginning of the rains,
as then there are many days of great
heat alternating with rain, thus producing
a constant rise and fall of the
subsoil water. Associated with these
is the constant presence of decaying
vegetation.

When new soil is turned up, there is a liberation
into the atmosphere of the fever producing
element the Plasmodium malariae, which
is inevitably followed by a number of
fever cases.

The medium of infection is in one of two
ways (1) by the air or (2) by water.
Malarial infection is carried by the
air, as is seen when the poison is
liberated by breaking up of the soil;
but probably the chief mode of infection
is by the drinking water. This especially
coincides with Manson's theory

of the mosquito being the intermediate host of the parasite, as with the death of the mosquito the parasite would gain liberty in the water and from that to reproduction in the human being is easy.

Causation: Any individual who has already had an attack of malarial fever is thereby predisposed to another attack, as unlike many other specific fevers, one attack does not confer immunity but rather by weakening the person's power of resistance, sets up a predisposition to a fresh attack. This is probably due to the great destruction of red corpuscles which takes place in malarial fever and the inability of the patient to renew them in their original numbers. Following on this destruction, the whole of the vis medicatrix naturae is diminished permanently so long as the person remains in the malarial district. With this predisposition, at any time fatigue, undue exposure to cold or to the sun's rays, or a wetting will act as exciting causes and give rise to an attack of the disease.

There is no doubt that of these exciting causes none are more potent than chill or a wetting. More than once in my own experience fever has resulted from exposure to the night air; and this especially during the dry season as then the fall of temperature after sunset is extreme. These things however do not produce fever of themselves, but set in action the real cause of the disease viz the Plasmodium malariae, without the presence of which in the blood there is not real malarial fever.

As to the Plasmodium being the cause of the fever, there can be no doubt since its constant presence in the blood in all cases of malarial fever can be demonstrated, a fact first firmly established by Laveran. Since then observers have been constantly at work studying the habits of the parasite as well as seeking to differentiate between the different varieties, which are supposed to give rise to the different types of the disease. These varieties present themselves more in connection with the different types of intermittent

fever, the Quotidian, Tertian and Quartan, but owing to the rather rare occurrence of these fevers on the West Coast, my opportunities of observation have been confined chiefly to the parasite as found in Remittent fever.

Of these four forms are to be found

(a) Spherical (b) Flagellated

(c) Crescentic (d) Segmented

(a) The Spherical form is to be found either free in the blood, or enclosed within the red corpuscles. In either case it may simply be a small colourless body, a little smaller than the corpuscle or it may be, and very often is pigmented. The pigment is in the form of small black granules, and is the result of the disintegration of the Haemoglobin of the corpuscles into Melanin under the influence of the growth of the endo-corpuscular parasite. The spherical form has the power of motion and by means of this it is enabled to move about in the blood and attach itself to a corpuscle, within which it soon begins to develop at the expense of the corpuscle

(b) The flagellated form is just the spherical form with the addition of one or two flagellae. This form is about the size of a red corpuscle and is pigmented. As to the presence of the flagellae, Manson holds that the flagellae are developed for the purpose of the parasite existing outside the corpuscle. He holds that the mosquito by means of the proboscis extracts blood from an individual. These corpuscles, many of them having parasites, pass into the stomach of the mosquito, where the digestive juices dissolve the capsule of the corpuscle and set free the parasite. The parasite then develops flagellae and by means of these buries itself in the body of the mosquito. When the latter dies the parasite is developed in the swamps and thus passes to the human body.

(c) The crescent form is to be found generally in the blood of 'old coasters' and is associated with the recurrent attacks of fever so common in temperate zones among those who have returned from malarial districts.
It is half-moon shaped with tapering

ends curved on themselves. In size it is as large as, and often larger than, the red corpuscle. I have seen specimens of this form completely occupying the body of a red corpuscle and just about to be set free.

These forms are pigmented but they have not the power of motion. It is believed that they persist for long periods in the blood and have the greatest power of all the forms to resist the influence of quinine. They may remain quiescent for months or years but any undue exposure to cold will set them in active development with a resulting attack of fever.

(d) The segmented forms are really only a further development of the circular form, in that this form has gone on to sporulation and what was formerly a circular amoeboid body has now been divided up into segments each of which has a clump of pigment and will soon be set free by the capsule of the corpuscle being dissolved. When the segments are

set free the pigment escapes.
The relation of these various forms to one another and to the corpuscles during the stages of the fever are as follows.
During the remission of the fever in cases where the blood has been stained by methyl blue pale ~~to~~ blue bodies like sago grains are to be found in the blood. These rapidly attach themselves to the corpuscles and by means of their amoeboid movement are able to penetrate into the corpuscles. There they increase in size during the remission and this at the expense of the corpuscle which grows pale and its Haemoglobin gets converted into melanin which is deposited in the parasite.
Immediately before the next attack the endo-corpuscular body develops into spores each of which is pear shaped with its broad part at the circumference of the corpuscle and the pigment concentrated in the centre. With the destruction of the corpuscles the spores are set free as rounded colourless bodies, while the pigment is also liberated

as a mass of melanin. Coincident with this setting free of the spores, the temperature reaches its maximum. The free spores become the circular parasites which again attach themselves to the corpuscles and the process of reproduction is repeated. A certain number of free spores are undoubtedly killed by means of Phagocytosis, but a great many escape and go on in the life cycle unless they are destroyed by the influence of drugs. In some cases the ends-corpuscular bodies seem to be arrested in their development and instead of going on to segmentation, they become crescent forms which remain in the blood and seem to resist to a large degree both the natural process of Phagocytosis and also the influence of drugs.

Symptoms:

Remittent fever the commonest type on the Coast may be either simple or grave

The simple form of remittent fever is not as a rule associated with a rigor, although

this may be present in some cases. The general premonitory symptoms are those of depression and languor. For a few days before the onset of the disease, the patient complains of feeling tired and having little or no appetite and a general disinclination to exertion. Then there supervenes on this a feeling of chilliness which falls short of a rigor, and the patient complains of great headache and soreness all over the body especially in the back and limbs. Often in many cases the first symptom noticed is pain in the leg. The loss of appetite develops into nausea or in many cases slight sickness.

If the temperature is now taken it will be found to range between 102°F and 105°F, and the skin is hot and dry. At the outset when the skin is dry there is generally an increased flow of urine, but as the sweating becomes general the urine diminishes in quantity. In a few hours from the onset the

temperature begins to fall a degree or two, accompanied by sweating. The temperature however does not come down at once to normal but remains as a rule between 101° F and 102° F. In this way the disease progresses with a daily increase towards the evening, to be followed by a remission which generally is greater than that of the previous twenty-four hours; until by profuse perspiration and a gradual abatement of the symptoms the disease terminates. The mild form of remittent fever may have special symptoms developed in different cases. The commonest forms of these are associated with either special gastric symptoms, or they may constitute a type often distinguished as Bilious Remittent Fever.

Where gastric symptoms are prevalent the tongue is large and flabby, covered with a yellow fur. The temperature is higher than in the ordinary simple remittent, and as a rule the onset of the disease is marked by a severe rigor. Vomiting is common and the bowels are

constipated.
This form lasts from 3 to 7 days.

In Bilious Remittent fever there is a great quantity of bile discharged into the system, with the result that the patient is yellow and jaundiced in appearance very early in the disease.
In fact this feature is often present before the patient takes any note of fever being present at all; the symptoms all giving him the idea of what he describes as an attack of Biliousness. The fever is not abnormally high, but the constant bilious vomiting and purging are very distressing and weakening to the patient.
The urine is scanty and tinged with bile. The liver and spleen are tender.
This type of fever generally lasts six to eight days, and then subsides, but there is a probability that a relapse may take place in three or four days.
The action of the liver in disposing of effete corpuscles comes markedly

into action in Bilious Remittent fever
The corpuscles, broken up by malarial action, give up their Haemoglobin, which carried by the blood-stream to the liver is converted into bile pigment. The bile is partially re-absorbed into the system and deposited in the tissues, giving rise to jaundice, and by and bye is eliminated in the urine in the form of urobilin.
With each exacerbation of the fever there is a distinct loss of red corpuscles.

Of the grave forms of remittent fever there are three well known on the West Coast of Africa.
There are (1) The form associated with high temperature and cerebral symptoms
(2) The typhoid form
and (3) The Haemoglobinuric form

(1) The cerebral form is one of the most dangerous types of remittent fever, and in a great many cases it is fatal. The temperature goes up to an enormous height, in some cases

as high as 110°F, but in the latter cases the result is always fatal. What gives rise to this extreme temperature is difficult to say, but within my own experience the exciting cause has been chill resultant on exposure to cold.

In the first instance the patient had had an ordinary remittent fever for three or four days, the temperature varying between 101°F and 103°F. The patient was a nurse, and being anxious to know what her temperature was, she got up out of bed during the night and walked across the floor to get her Thermometer. The room in which she was lying was a very draughty one, and there is no doubt the getting out of bed caused her to be chilled with the result that in a few hours her temperature rose up to 107°F.

The second was much the same. A young assistant in one of the trading houses had his first attack of fever, an ordinary remittent, the temperature not reaching to 102°.5F. During the

day he got restless and very foolishly got out of bed and walked from his bed-room to the dining-hall, which is always exposed to the outside atmosphere. While there he got a bit delerious and had to be carried back to bed. In two hours his temperature ran up from a little over 102°F to 110°F with a fatal result. Manson in a lecture published in the "British Medical Journal" for Feb 1st 1896 describes some of these grave or pernicious forms of malarial fever and in speaking of the probable cause he says "These cerebral attacks are now explained, and it appears to me, correctly explained by the supposition that they depend on an embolism by a malarial parasite of the capillaries of the various nervous centres involved, in hyperpyrexia the thermic centres, in aphasia Broca's convolution and so on."

Along with the high temperature there is as a rule either delirium, convulsions or coma.

It seems to be that the extreme limit to which the temperature can go and yet there be recovery is 107°F or 108°F. The first case I have mentioned reached 107°F and recovered.

(2) The Typhoid type of remittent fever or the so-called Typho-malarial fever is a very dangerous form; but of the grave forms of remittent fever, I believe that with careful treatment and good nursing it is the least dangerous. In the cases I have known on the West Coast the disease seems to run a very definite course of between three and four weeks duration.

It very often appears as a development of gastric and bilious remittent fevers somewhere between the third and ninth days.

The temperature is very variable, but it rarely goes beyond 105°F, varying between this and 101°F.

The pulse is very weak and fast, and consequent upon this cardiac debility oedema often appears in the extremities.

The tongue becomes dry and brownish-black, being covered with sordes. Very frequently hypostatic congestion is to be noted in the lungs
The spleen is generally enlarged and tender; while the urine is concentrated, of high colour and contains albumen.
The danger to the patient is from asthenia owing to the prolonged sickness.

(3) The Haemoglobinuric form of Remittent fever is an extremely dangerous type, more so than the typhoid but not quite so virulent, in my experience, as the cerebral type.
It seems to have special characteristics of its own, the leading one being the presence of Haemoglobin in the urine, and another of great importance in the treatment is the fact that quinine has little beneficial effect upon its course, and in many cases rather a deleterious effect.
It is evidently malarial fever plus some other influence leading to a wholesale destruction of red corpuscles

in the blood. What this other influence amounts to seems not yet to be definitely known. Some observers hold that this disease is caused by a specially destructive type of the malarial parasite, and this seems to be borne out to some extent by the geographical distribution of the disease being confined to the parts that are more highly malarious than others. It is ~~evidently not~~ well known now in most parts of tropical Africa while it is almost unknown in China and India. Manson in the lecture already referred to says "The parasitology of Haemoglobinuric fever has hardly been worked at. Plasmodia have been found in the blood and organs but their specific characters have not been accurately determined. Considering the peculiar clinical manifestations it gives rise to, and the facts of geographical distribution, I think it very likely that the parasite of malarial haemoglobinuric fever is specifically different from the malaria parasites met with in

Europe and perhaps in India".
But there is another point in the causation of this disease that is being drawn attention to more and more, and that is the influence of quinine in this form of fever. Most observers are agreed that the ordinary doses of quinine (10 to 20 grs) are of no good, but rather dangerous while some go the length of asserting that quinine is a factor in the causation of the disease itself.
Personally I do not think that the evidence is sufficient yet to form a general conclusion upon; but the following facts seem to point towards the theory that quinine in large doses is deleterious to those at least who are predisposed to this type of fever by previous attacks.
The person who furnished these facts had already had Haemoglobinuria three or four times, and upon the advice of his medical attendant for the time being, took the large doses with the results recorded.
Monday 6th June 1892: Took 20 grs quinine in 6 gr doses every three hours

Tuesday 3 pm: Appearance of "Blackwater"

Sunday 19th June 1892: 15 grs quinine, 11 am
12 grs " , 12 noon
'Blackwater' appeared at 3 pm.

Saturday 2nd July: 8 grs quinine 10 pm
Sunday 3rd " : 10 grs " 1.30 am
" " " : 5 grs " 3.30 am
"Blackwater" 8 am 3rd July

Saturday 16th July: 15 grs quinine 3.30 pm
15 grs " 4.10 pm
"Blackwater" at 9 pm

Friday 29th July: 20 grs quinine 9 pm
"Blackwater" at 7 am on 30th inst

This patient came under my care in 1895-96. On the 30th June 1896 I was called to see him. He had been taking quinine intermittently for two or three days. That day he had taken 6 grs at 8 am, and at 1.30 pm he passed 'blackwater'. At 2 pm same day, I gave him 4 grs quinine, and put him on diaphoretics and mild diuretics with the result that the urine increased in

quantity and showed progressive improvement in colour.

From these facts I am led to infer that to one who has already had Haemoglobinuric fever, quinine in anything like large doses is undoubtedly dangerous, in that it may induce a re-appearance of the disease

The danger in this class of cases is from suppression of the urine and consequent uraemic convulsions and coma.

The fever is remittent and is not high, reaching generally to 102°F or 103°F.

There is usually tenderness or pain over the liver and jaundice, accompanied by bilious vomiting and diarrhoea.

The urine is scanty and gets very dark in colour, and there is pain in the loins.

The tongue is covered with a yellow fur and thin at the edges.

This may continue for three or four days and then the patient breaks out into a profuse sweat; the temperature gradually subsides and coincident with this the urine gets more in quantity and lighter in tint.

In mild cases the kidneys are only slightly congested; but in fatal cases there is an

inflammation set up by irritation from the formation of tube casts.
"Free Haemoglobin in the blood acts as a poison and is eliminated by the kidneys. It acts deleteriously on the kidneys causing the formation of tube casts and the presence of albumen in the urine. The general symptoms are referable to irritation of the kidneys" (Coats Manual of Pathology page 94)
The thickened and dark state of the urine is due to the presence of Haemoglobin in it and the free Haemoglobin is obtained by the solution of the corpuscles in the blood. Thus we are brought back to the theory that whatever is the cause of Haemoglobinuric fever, that cause acts by destruction of the red corpuscles.

Intermittent Fever or Ague

This is by no means a common type of disease on the West Coast; when it does appear it is generally among those who have been a long time in the tropics, and whose systems have been to some extent immured to the malarial influences. Occasionally however it does

appear in individuals who are not 'old coasters', as in my own case where my second fever was of the intermittent type, after about nine months residence.

This disease presents three types

(1) Quotidian, in which the paroxysm occurs once each day

(2) Tertian, in which the paroxysm comes every alternate day, and in my experience this is the commonest ~~type~~ form on the Coast.

(3) Quartan, in which two days interval occurs between the paroxysms

During the intermission of the fever the patients temperature remains normal, and in mild cases the patient is able to be up out of bed and going about his work.

The average duration of the paroxysm is eight to ten hours.

The Symptoms are in three stages

(a) Cold Stage

(b) Hot "

(c) Sweating "

During the cold stage the patient complains

of feeling languid and worn out. There is constant yawning and frequently nausea. Then a chilly feeling passes over the patient with trembling all over so that immediately violent shivering takes place, the patients teeth knocking together and his skin being drawer-like and of a bluish tint.

Supervening on this is violent headache, intense thirst and usually constipation. The pulse is small and hard.

Then gradually the feeling of cold gets less, and the patient begins to feel a little more comfortable. In about two hours from its onset, the cold stage disappears and gives place to the Hot stage

Now the comfortable feeling passes away and the patient complains of being too hot. The skin is very dry. The headache and thirst continue, and the pulse becomes full, strong and fast. The temperature which has been rising during the cold stage, now reaches its highest point and the patient often complains of a sense of suffocation. This stage lasts for two or three hours and then passes into

the sweating stage. This is signalised by the appearance at first of a little, and then of profuse perspiration beginning on the forehead and gradually extending all over the body.

For a short time after the sweating begins the temperature remains stationary; but by and bye it begins to fall, at first very slowly and then more quickly.

The pulse becomes soft and slower and the symptoms gradually subside.

The urine when passed during this stage is thick and dark with a deposit of urates.

The patient becomes quiet and feels very much relieved, often falling into a sleep, and when he wakes the temperature is found to be normal.

These symptoms are repeated every day or every second or third day according as the type of fever is quotidian, tertian or quartan.

The temperature rises to between 103°F and 105°F in ordinary cases.

After two or three paroxysms the height of the temperature gets less in each exacerbation, and its appearance is delayed until ultimately it disappears

altogether. Should the paroxysm appear earlier than is expected, it is well to be on the watch for grave symptoms, as this is an abnormal condition.
The disease may prove fatal by the onset of coma with or without delirium during the hot stage, or by loss of consciousness and heavy breathing at the beginning of the paroxysm indicating apoplexy.
The rise of temperature is due to the increased oxidation which goes on from the presence of the parasites in the blood. The chill is due to tetanic spasm of the cutaneous arteries, while the hot stage is due to the relaxation of the arteries.
The diagnosis of malarial disease is always settled by the presence of the parasite in the blood during a fever. It requires a little experience to be able to recognise the plasmodia but once acquainted with the actual appearances under the microscope it is easy to make them out.
Remittent fever may be confounded with tropical typhoid, but there are

no rose coloured spots in remittent fever.
The Prognosis of the mild types in an ordinary healthy individual is favourable. But the prognosis will be grave if the person's constitution has been undermined by a series of previous attacks or by intemperate habits.
There is nothing renders the outcome of a malarial case so doubtful as previous intemperance.
Extremes of age are also dangerous.
In an epidemic any case of malarial fever may take on the epidemic type and so render the prognosis doubtful.
All the grave types are to be viewed as uncertain in result.

Treatment: The prophylactic treatment is being viewed of more importance now than formerly. It is to be directed in two ways; (1) that of rendering all houses and surrounding grounds as sanitary and as dry as possible. Where it can be attained at all, it is highly desirable to have drainage of the surrounding land diverted away from the dwelling as much as possible.

(2) That of the administration of drugs with the view of anticipating the development of the disease and checking it.
The drug almost universally adopted is quinine.
Many believe in the continual administration of the drug in small doses of 1 6 2 grs daily; but this I do not think to be of much use. A certain tolerance of the drug is established when taken daily in this way, and thereby the therapeutic effects are diminished. I do believe however that when one is likely to be travelling through a highly malarious district, or has been exposed too much to the influence of the sun, or in any way chilled, then it is advisable to resort to quinine to prevent any evil effects. All of these conditions are liable to act as exciting causes and set up an attack of the disease, and to prevent this I believe a dose of 5 grs quinine repeated two or three times every five or six hours is highly beneficial.

During the actual attack of the disease the treatment must be directed to both the symptoms and the actual

cause of the disease, the plasmodium malariae.
Symptomatic treatment: At the beginning of the paroxysm when the patient complains of chilliness he must be covered with warm blankets and hot bottles put to the feet. A glass of hot water and brandy at the outset has an excellent effect in shortening the cold stage and forcing the perspiration.
Where vomiting is present this can generally be relieved by the application of mustard to the epigastrium and by giving the patient pieces of ice to suck. When sweating begins we can relieve the patient a little by removing one or two of the blankets, taking care not to give a chill. When the perspiration is profuse, it is very refreshing to be sponged down with tepid water. Should headache be severe, cloths dipped in cold water, and spirituous evaporating lotions are of much use. For this also some adopt antipyrin (5-15 grs); I find that phenacetin is very useful and rapid in its results in doses of 5-10 grs.
For constipation or even as a matter

of routine it is well to give purgatives. The compound called "Livingstone Rousers" composed of Calomel, Jalap, Rhubarb, and Quinine, I find to be the very best general purgative in cases of malarial fever. One or two of the tabloids, followed by a saline in three or four hours, unloads the liver and bowels very well; and this repeated every second or third day very often prevents the accumulation of bile in the system.

Specific Treatment.

Quinine has fully earned the reputation of being a specific in the treatment of this disease. Many other drugs have been advocated from time to time, with the view of taking the place of quinine, but none have had any lasting reputation equal to that of quinine.

The methods of giving it have improved very materially, so that now many persons can assimilate the necessary quantity of the drug, who formerly could not have taken what was required in the form of the ordinary sulphate. With tabloids, pills and effervescent solutions, we

are now able to give the drug in such a way as to produce the least possible degree of distress in almost any case.
For rapid action we have now a very suitable and powerful preparation in the form of the Acid Hydrochlorate for hypodermic injection.
Where the stomach is irritable and for other reasons it is not thought advisable to administer the drug hypodermically, then we can resort to quinine enemata with very good results.
On the whole, for administration by the mouth the best preparation is the sulphate or bi-sulphate, both of which are easily soluble.

In the remittent form of fever, I usually soon after administering hot drinks and purgatives, give the patient 10-15 grs of the sulphate to begin with and then continue with doses of 10 grs thrice daily. As a rule the remissions are not sufficiently marked to warrant one in waiting for the fall of the temperature but should this happen then the best time undoubtedly is during

the remission. At that time a good dose of 15 grs will do a great deal to modify the heat rise in temperature, especially if followed by doses of 5-10 grs every five or six hours.

Very frequently when the temperature in remittent fever is running well up, that is to about 105°F, I give 10 grs antipyrin along with 10 grs quinine. The antipyrin acts by rapidly reducing the temperature, while the quinine retains a controlling effect and modifies the next exacerbation.

In intermittent fever the best results are usually obtained by waiting till the first paroxysm is abating and then exhibiting 10-15 grs quinine on the falling temperature, and repeating in 5 gr doses every four hours until about 30 grs have been given before the next paroxysm. Should the paroxysms continue it is well to repeat the doses during the intermissions until the fever is overcome.

In the treatment of any form of malarial fever, should manifestations of cinchonism appear it is better not to push the drug any further. Where cinchonism is induced even by a small dose, dissolving the drug with the aid of Hydrobromic acid prevents the distressing symptoms.

Where the drug is given in the form of pills or tabloids we must take care that these are absorbed, as sometimes where the action of the stomach is weakened by fever, there is not enough digestive power to absorb these forms; and they may pass, as I have seen, almost entirely unaffected per rectum. When this is so the drug must be given in one of the other ways as in solution or per rectum.

Hypodermic injection is of most value when it is required to bring the system under the influence of the drug at once as in comatose cases.

In cases where there is high temperature

and threatening coma active measures must be resorted to at once, and these consist in applying ice to the head, giving an active and rapid purgative as well as the hypodermic injections of quinine
For these forms also, baths gradually reduced in temperature are exceedingly valuable and when resorted to in time have excellent results.
In one case of this type which came under my notice, nature worked her own cure. The patient's temperature (a lady) ran up to 107°F and there were signs of threatening coma, when suddenly the temperature began to fall coincident with the onset of menstruation. This I believe relieved the cerebral congestion and so prevented the onset of coma.

In the treatment of Haemoglobinuric fever quinine is of doubtful value. It is well however to give it in small doses as this keeps the temperature, which is not high,

in check. Active purgation by means of doses of Calomel, free action of the skin by diaphoretics, and constant flushing of the kidneys by means of diluent fluids, constitute in my opinion the best basis of treatment. Where there is any pain in the loins, dry cupping is valuable in relieving renal congestion. Turpentine and Tr. Ferri Perchlor. have both been advocated in this type but of their effects I cannot speak from experience.

In all the grave forms of malarial infection the chances of recovery are very much increased if along with medicinal treatment the patient can be put in the hands of properly trained nurses. This is especially so in the typhoid type. For the last two years we have had the services of such nurses in Old Calabar with the result that many cases, which in the pre-nursing days would inevitably have died, have been brought through their fevers

and sufficiently established in health to enable them to return to a temperate climate.

The action of the quinine in malarial fevers is two fold

(1) It lowers the temperature by ~~food~~ interfering with the production of heat, through preventing oxygenation of the tissues.

and (2) It controls the fever processes by destroying the parasites.

Should chronic malarial infection be established it is best to order the person a change of climate, while at the same time prescribing quinine during any relapses and a course of Arsenic in the interval as an alternative.

For ~~viol~~ enlargement of the liver or spleen, inunction with a weakened ung. Hydrarg. Iod. Rub. I find to be the best line of treatment.